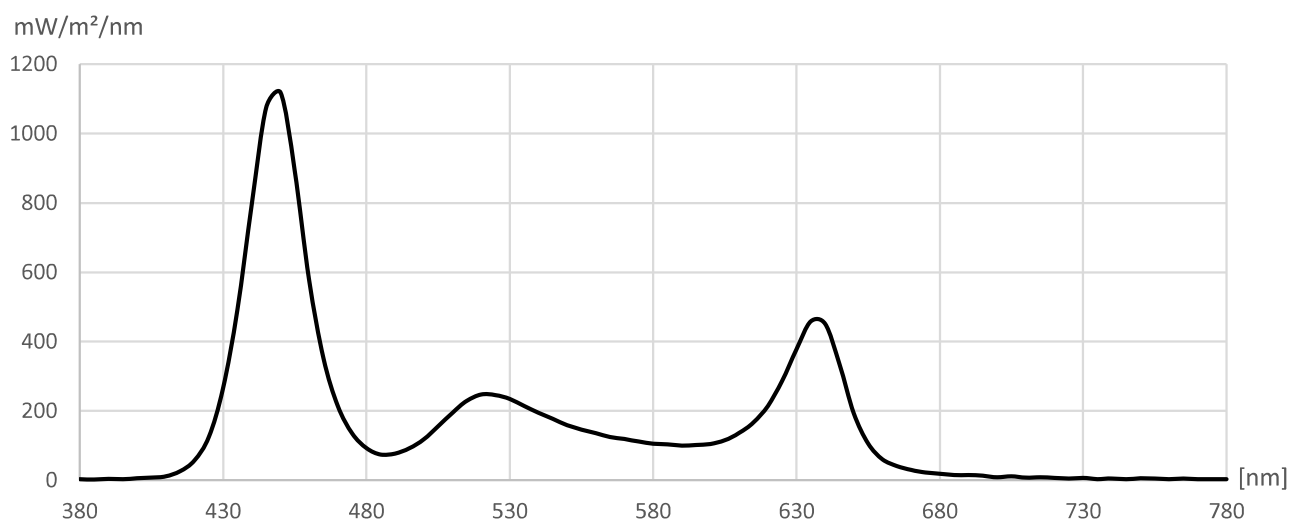


Measurement protocol

th.mann

Test object: Fun Generation
PicoBeam 60 COB RGBW
442853 / all / @ 3 m

Measurement file: 442853_all_3m.CSV
Date of measurement: 30.09.2019
Time of measurement: 15:07:07



R1 = -	Ra = -	Illuminance	12621,48 lx	CIE1931
R2 = -	Re = -	Ee	64,858 W/m ²	x = 0,2577
R3 = -	GAI = -	LER	194,6 lm/W	y = 0,1930
R4 = -				
R5 = -		correlated color temperature (CCT)	> 50000 K	CIE1976
R6 = -		Duv	-	u' = 0,2147
R7 = -				v' = 0,3618
R8 = -		Saturation	44,3 %	
R9 = -				CIE1960
R10 = -		Dominant wavelength	412 nm	u = 0,2147
R11 = -		Peak wavelength	449 nm	v = 0,2412
R12 = -				
R13 = -		Flicker frequency	183,1 Hz	TM30
R14 = -		Percent Flicker	6,9 %	Rf = -
R15 = -		Flicker index	0,005	Rg = -

[nm]	mW/m ² /nm	[nm]	mW/m ² /nm	[nm]	mW/m ² /nm	[nm]	mW/m ² /nm	[nm]	mW/m ² /nm	[nm]	mW/m ² /nm	[nm]	mW/m ² /nm
380	2,66	440	796,38	500	117,94	560	135,65	620	214,42	680	19,01	740	5,37
385	2,32	445	1075,06	505	156,03	565	124,73	625	285,72	685	14,93	745	3,09
390	3,98	450	1118,09	510	194,58	570	118,81	630	377,41	690	14,98	750	5,53
395	3,02	455	894,16	515	228,82	575	111,53	635	458,26	695	12,90	755	4,91
400	5,73	460	578,93	520	246,95	580	105,52	640	451,08	700	8,48	760	3,22
405	7,66	465	352,30	525	245,83	585	103,46	645	334,31	705	11,10	765	4,51
410	11,07	470	214,07	530	234,14	590	100,00	650	194,16	710	7,29	770	3,17
415	26,18	475	134,94	535	213,92	595	101,64	655	106,23	715	8,33	775	3,34
420	57,07	480	92,19	540	195,09	600	104,80	660	60,50	720	6,85	780	2,82
425	125,40	485	74,45	545	177,06	605	115,28	665	41,04	725	5,28		
430	264,75	490	77,19	550	159,10	610	136,31	670	29,49	730	6,59		
435	491,13	495	92,17	555	146,33	615	166,66	675	22,75	735	3,51		

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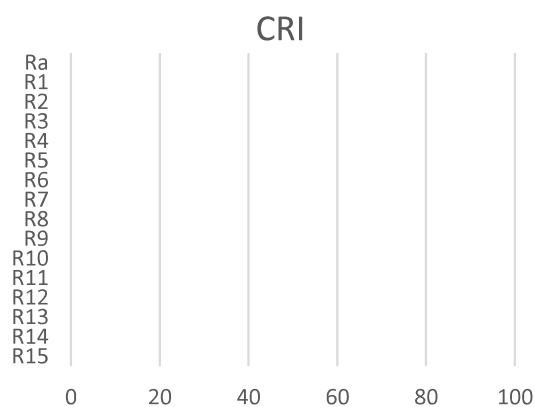
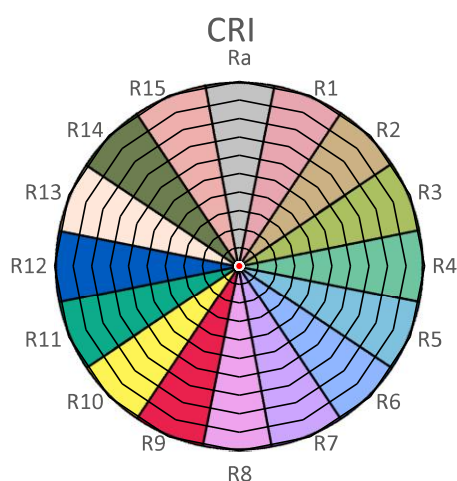
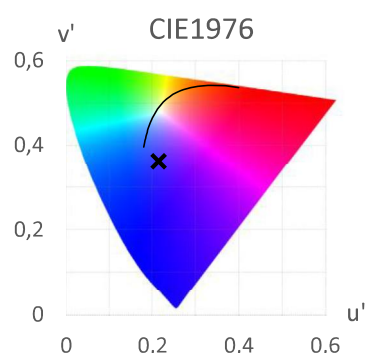
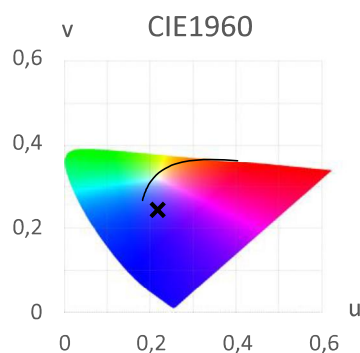
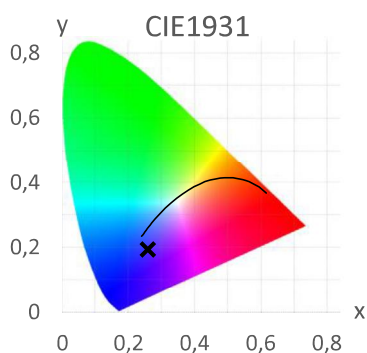
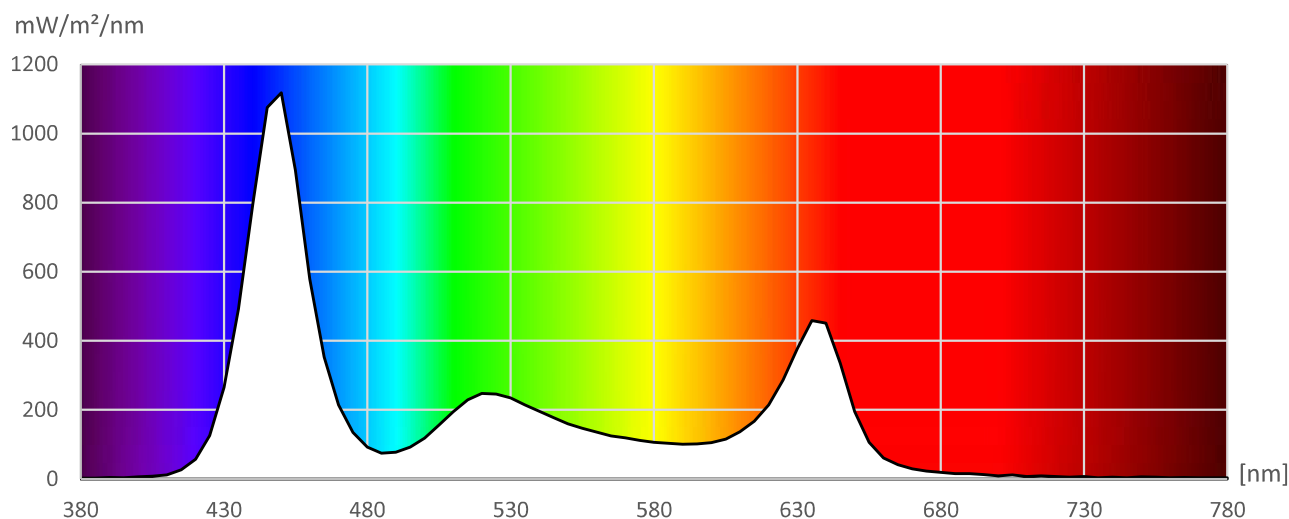
First, last name of inspector

Measurement protocol

th•mann

Test object: Fun Generation
PicoBeam 60 COB RGBW
442853 / all / @ 3 m

Measurement file: 442853_all_3m.CS'
Date of measurement: 30.09.2019
Time of measurement: 15:07:07



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Burgebrach, 30.09.2019

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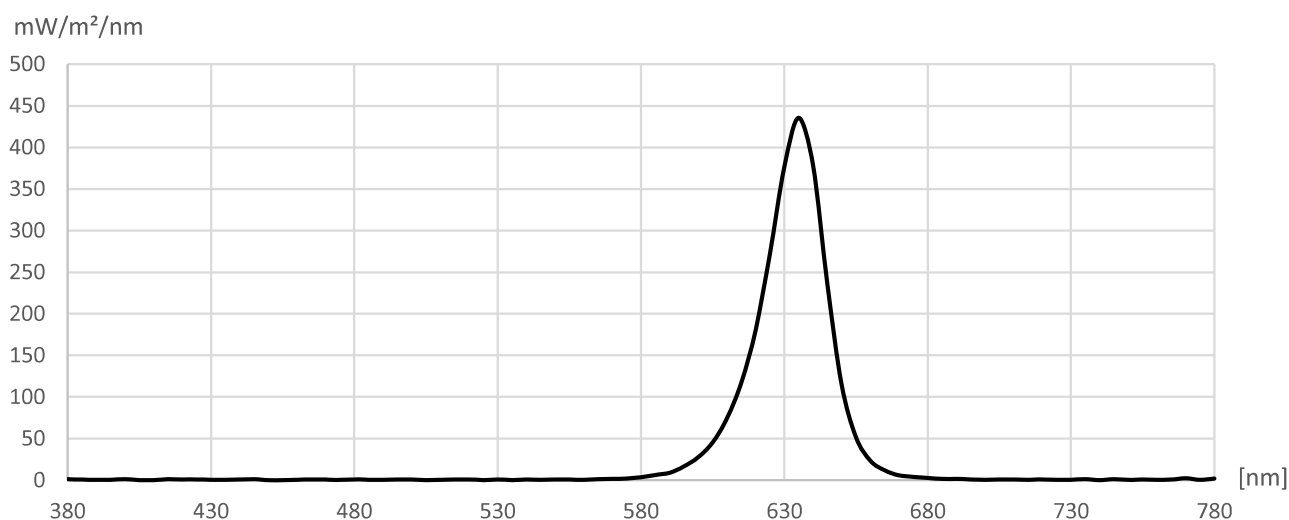
First, last name of inspector

Measurement protocol

th.mann

Test object: Fun Generation
PicoBeam 60 COB RGBW
442853 / red / @ 3 m

Measurement file: 442853_red_3m.CSV
Date of measurement: 30.09.2019
Time of measurement: 15:05:55



R1 = -	Ra = -	Illuminance	2190,09 lx	CIE1931
R2 = -	Re = -	Ee	12,221 W/m²	x = 0,6891
R3 = -	GAI = -	LER	179,2 lm/W	y = 0,3043
R4 = -				
R5 = -		correlated color temperature (CCT)	< 1600 K	CIE1976
R6 = -		Duv	-	u' = 0,5227
R7 = -				v' = 0,5193
R8 = -		Saturation	97,9 %	
R9 = -				CIE1960
R10 = -		Dominant wavelength	628 nm	u = 0,5227
R11 = -		Peak wavelength	634 nm	v = 0,3462
R12 = -				
R13 = -		Flicker frequency	183,1 Hz	TM30
R14 = -		Percent Flicker	4,9 %	Rf = -
R15 = -		Flicker index	0,004	Rg = -

[nm]	mW/m²/nm	[nm]	mW/m²/nm	[nm]	mW/m²/nm	[nm]	mW/m²/nm	[nm]	mW/m²/nm	[nm]	mW/m²/nm	[nm]	mW/m²/nm
380	1,18	440	0,87	500	0,73	560	0,44	620	180,85	680	2,76	740	0,04
385	0,75	445	1,26	505	0,28	565	1,31	625	271,64	685	1,51	745	1,24
390	0,69	450	0,04	510	0,50	570	1,49	630	375,97	690	1,70	750	0,37
395	0,70	455	0,04	515	0,95	575	1,98	635	435,61	695	0,93	755	0,82
400	1,21	460	0,63	520	0,97	580	3,75	640	378,81	700	0,55	760	0,53
405	0,29	465	0,76	525	0,32	585	6,40	645	235,06	705	0,92	765	0,78
410	0,21	470	0,76	530	0,91	590	9,10	650	115,87	710	1,03	770	2,35
415	1,10	475	0,32	535	0,30	595	16,47	655	52,13	715	0,65	775	0,45
420	1,06	480	1,05	540	0,77	600	27,74	660	23,55	720	1,06	780	2,02
425	1,06	485	0,68	545	0,36	605	45,34	665	11,84	725	0,48		
430	0,62	490	0,44	550	1,00	610	74,43	670	5,91	730	0,68		
435	0,38	495	0,84	555	0,73	615	117,59	675	4,11	735	1,25		

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Burgebrach, 30.09.2019

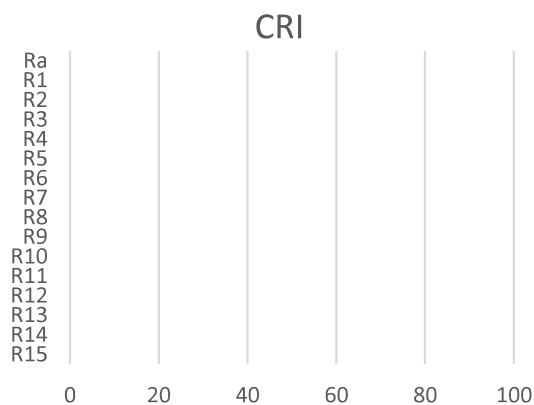
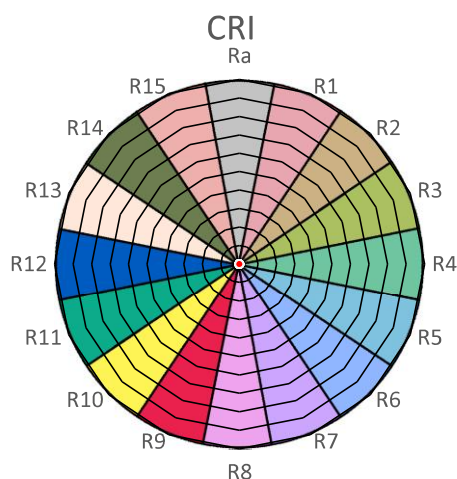
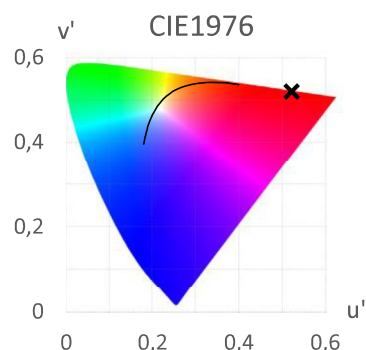
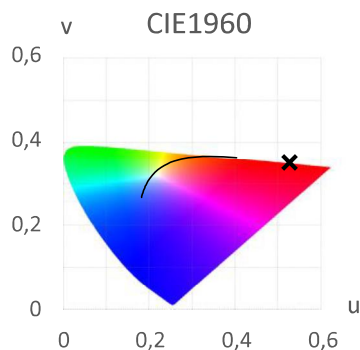
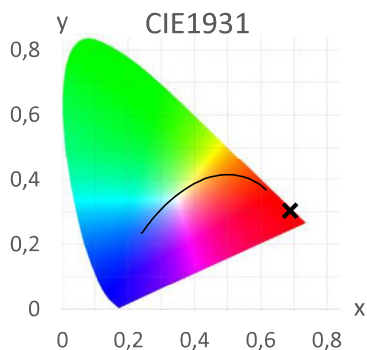
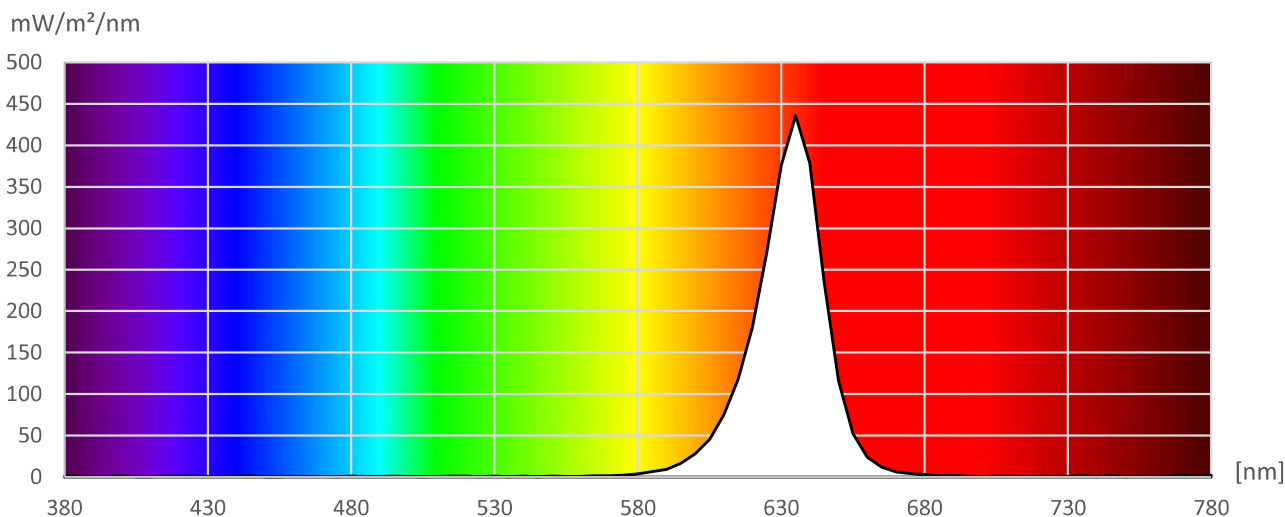
First, last name of inspector

Measurement protocol

th•mann

Test object: Fun Generation
PicoBeam 60 COB RGBW
442853 / red / @ 3 m

Measurement file: 442853_red_3m.C
Date of measurement: 30.09.2019
Time of measurement: 15:05:55



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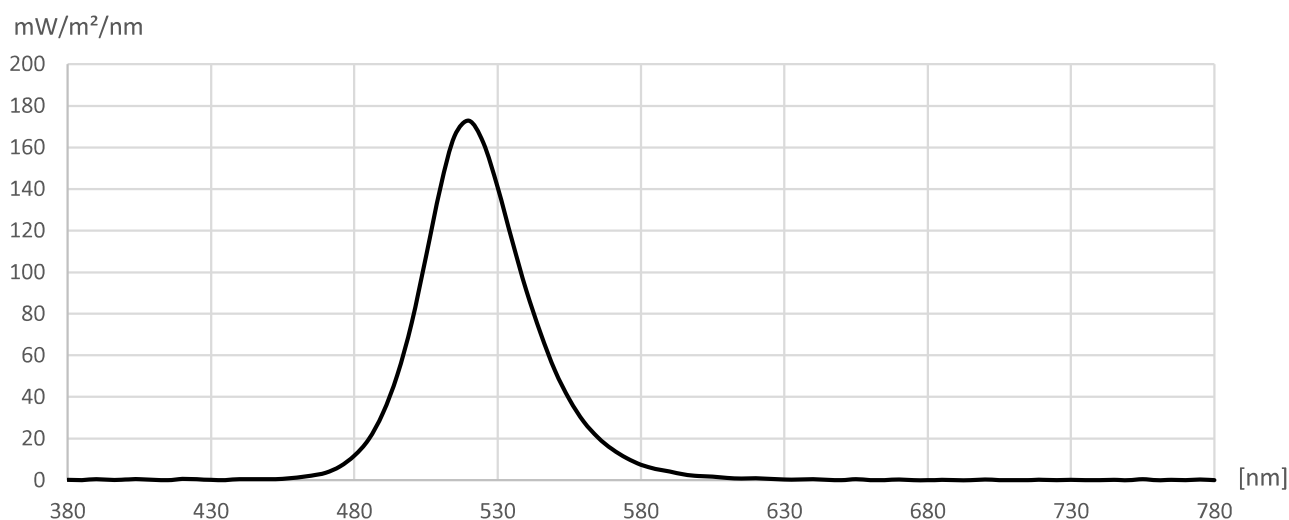
First, last name of inspector

Measurement protocol

th.mann

Test object: Fun Generation
PicoBeam 60 COB RGBW
442853 / green / @ 3 m

Measurement file: 442853_green_3m.CSV
Date of measurement: 30.09.2019
Time of measurement: 15:06:09



R1 = -33,1	Ra = -17,1
R2 = -0,4	Re = -47,4
R3 = -6,4	GAI = 1,2
R4 = -57,3	
R5 = -7,6	
R6 = -7,3	
R7 = 3,2	
R8 = -28,2	
R9 = #####	
R10 = -86,9	
R11 = -84,3	
R12 = -20,1	
R13 = -36,9	
R14 = 47,0	
R15 = -37,5	

Illuminance	3714,85 lx
Ee	7,873 W/m ²
LER	471,8 lm/W
correlated color temperature (CCT)	7914 K
Duv	0,1546
Saturation	72,7 %
Dominant wavelength	522 nm
Peak wavelength	519 nm
Flicker frequency	183,1 Hz
Percent Flicker	4,9 %
Flicker index	0,004

CIE1931
x = 0,1718
y = 0,7008
CIE1976
u' = 0,0621
v' = 0,5700
CIE1960
u = 0,0621
v = 0,3800
TM30
Rf = 1,5
Rg = 11,7

[nm]	mW/m ² /nm	[nm]	mW/m ² /nm	[nm]	mW/m ² /nm	[nm]	mW/m ² /nm	[nm]	mW/m ² /nm	[nm]	mW/m ² /nm	[nm]	mW/m ² /nm
380	0,26	440	0,50	500	75,68	560	28,16	620	0,91	680	0,00	740	0,08
385	0,11	445	0,47	505	107,75	565	20,61	625	0,66	685	0,14	745	0,17
390	0,50	450	0,49	510	140,67	570	14,87	630	0,38	690	0,09	750	0,00
395	0,13	455	0,66	515	165,43	575	10,65	635	0,29	695	0,00	755	0,47
400	0,31	460	1,34	520	172,79	580	7,47	640	0,51	700	0,33	760	0,00
405	0,57	465	2,27	525	162,22	585	5,45	645	0,20	705	0,10	765	0,20
410	0,17	470	3,58	530	140,70	590	4,18	650	0,06	710	0,03	770	0,00
415	0,05	475	6,60	535	115,22	595	2,76	655	0,50	715	0,07	775	0,34
420	0,62	480	11,93	540	91,47	600	2,06	660	0,09	720	0,28	780	0,00
425	0,48	485	19,62	545	70,76	605	1,78	665	0,09	725	0,00		
430	0,17	490	32,27	550	52,71	610	1,12	670	0,34	730	0,21		
435	0,09	495	50,63	555	38,92	615	0,83	675	0,00	735	0,00		

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Burgebrach, 30.09.2019

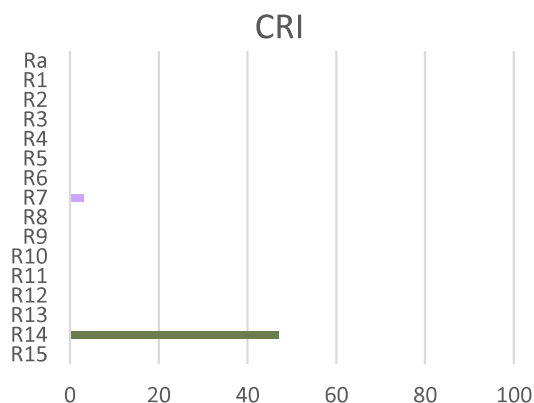
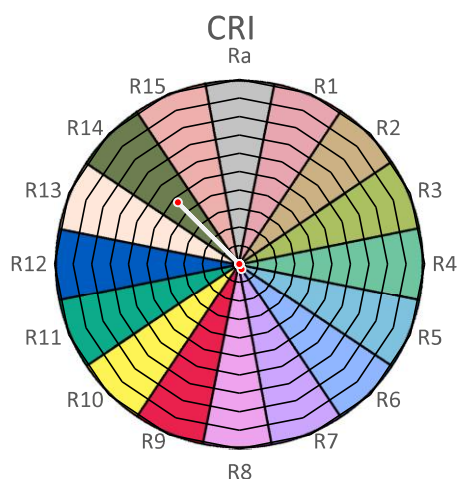
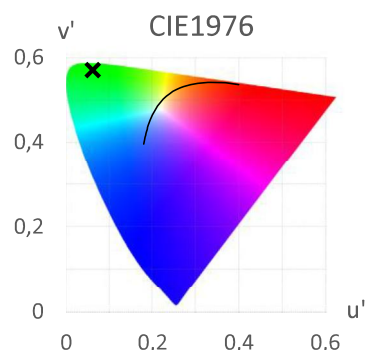
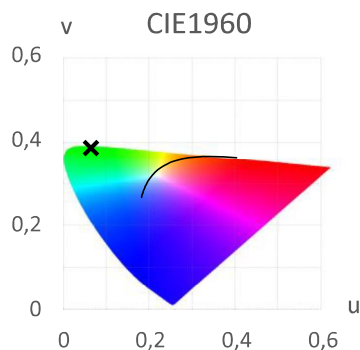
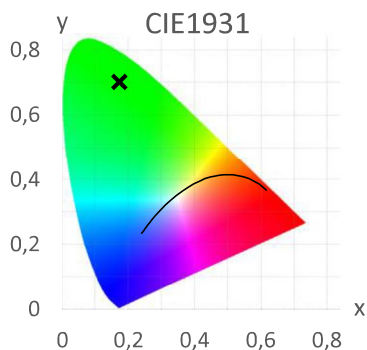
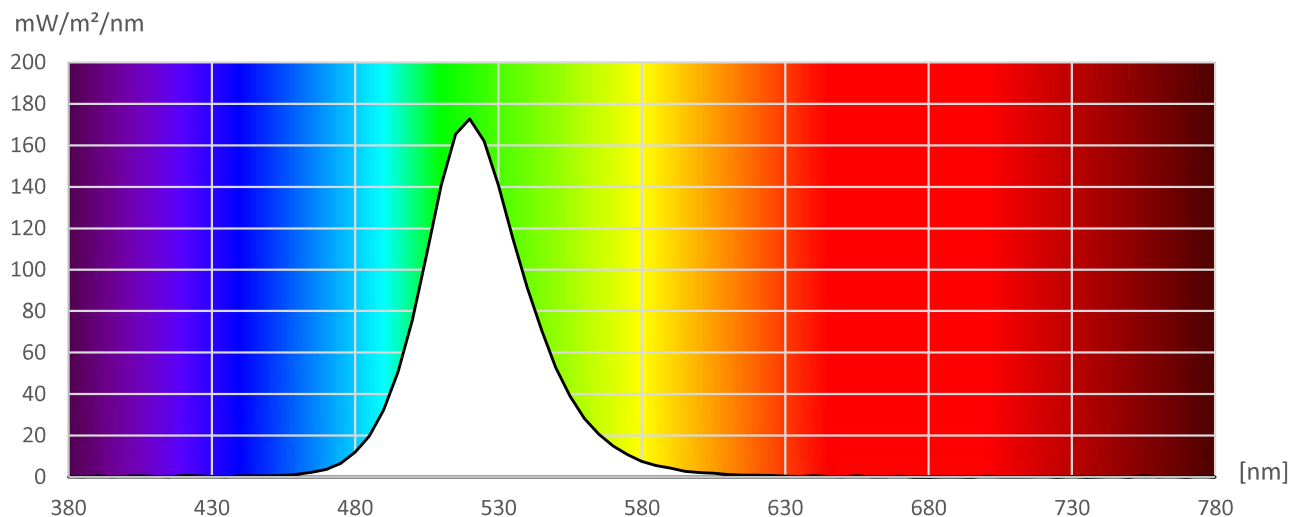
First, last name of inspector

Measurement protocol

th•mann

Test object: Fun Generation
PicoBeam 60 COB RGBW
442853 / green / @ 3 m

Measurement file: 442853_green_3m
Date of measurement: 30.09.2019
Time of measurement: 15:06:09



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Burgebrach, 30.09.2019

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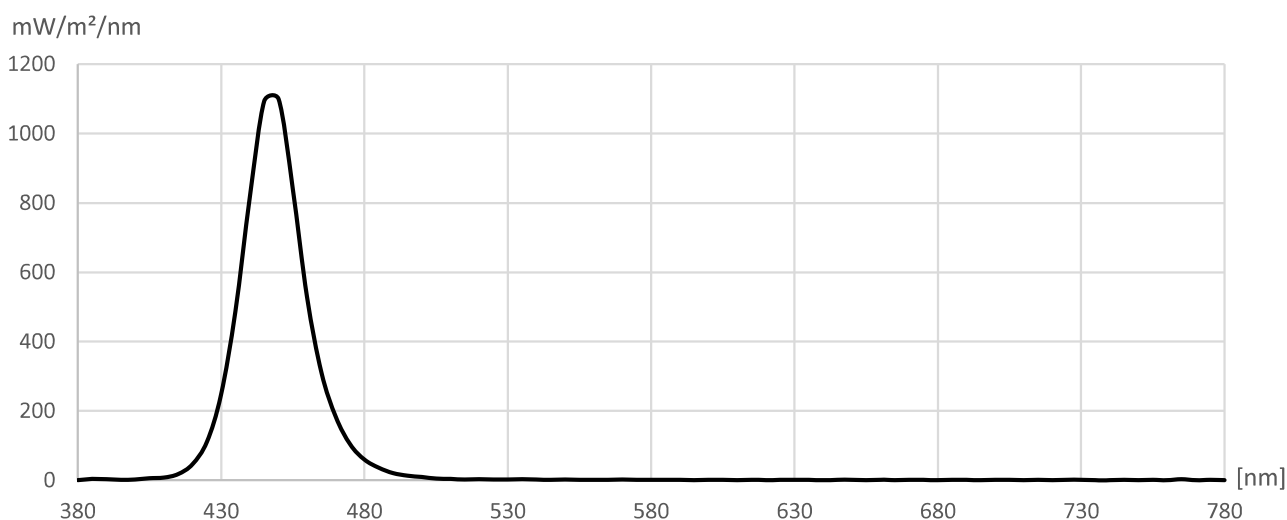
First, last name of inspector

Measurement protocol

th.mann

Test object: Fun Generation
PicoBeam 60 COB RGBW
442853 / blue / @ 3 m

Measurement file: 442853_blue_3m.CSV
Date of measurement: 30.09.2019
Time of measurement: 15:06:25



R1 = -	Ra = -	Illuminance	980,94 lx	CIE1931
R2 = -	Re = -	Ee	30,576 W/m²	x = 0,1559
R3 = -	GAI = -	LER	32,1 lm/W	y = 0,0238
R4 = -				
R5 = -		correlated color temperature (CCT)	> 50000 K	CIE1976
R6 = -		Duv	-	u' = 0,2097
R7 = -				v' = 0,0720
R8 = -		Saturation	98,6 %	
R9 = -				CIE1960
R10 = -		Dominant wavelength	434 nm	u = 0,2097
R11 = -		Peak wavelength	447 nm	v = 0,0480
R12 = -				
R13 = -		Flicker frequency	% < 2.5 Hz	TM30
R14 = -		Percent Flicker	< 2.5 %	Rf = -
R15 = -		Flicker index	% < 2.5	Rg = -

[nm]	mW/m²/nm	[nm]	mW/m²/nm	[nm]	mW/m²/nm	[nm]	mW/m²/nm	[nm]	mW/m²/nm	[nm]	mW/m²/nm	[nm]	mW/m²/nm
380	0,00	440	816,07	500	9,13	560	1,01	620	0,72	680	0,01	740	0,01
385	3,85	445	1092,79	505	5,22	565	1,48	625	0,78	685	1,23	745	1,21
390	2,89	450	1099,54	510	3,88	570	1,90	630	1,11	690	0,89	750	0,09
395	1,63	455	843,05	515	2,44	575	1,16	635	0,77	695	0,04	755	1,46
400	1,94	460	528,13	520	3,29	580	0,81	640	0,01	700	1,02	760	0,00
405	6,03	465	310,58	525	2,15	585	1,33	645	1,01	705	1,10	765	3,16
410	7,39	470	182,45	530	1,88	590	1,47	650	1,67	710	0,00	770	0,00
415	18,04	475	103,20	535	2,82	595	0,47	655	0,00	715	1,57	775	1,54
420	46,13	480	59,05	540	1,81	600	1,52	660	1,68	720	0,43	780	0,55
425	110,92	485	35,92	545	1,25	605	1,14	665	0,14	725	1,62		
430	246,29	490	20,91	550	2,41	610	0,06	670	1,30	730	1,16		
435	487,01	495	13,16	555	1,42	615	1,08	675	0,89	735	0,01		

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Burgebrach, 30.09.2019

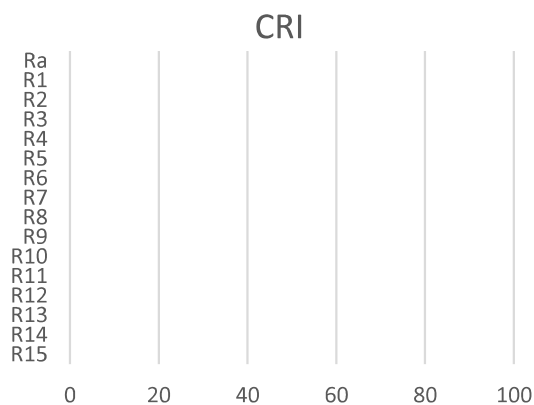
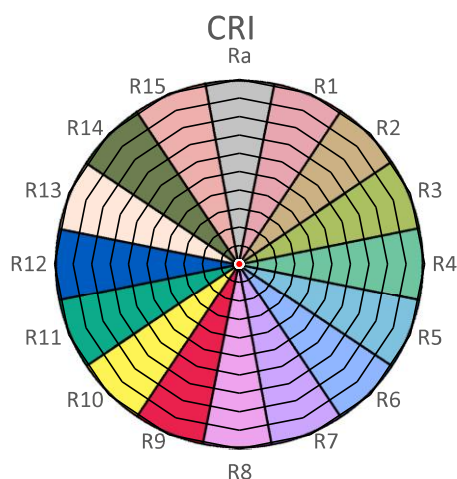
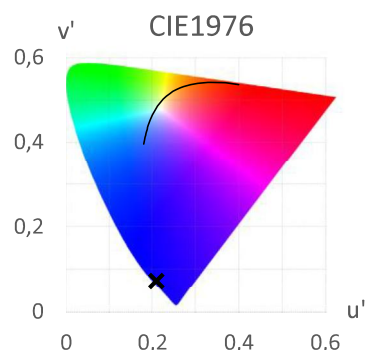
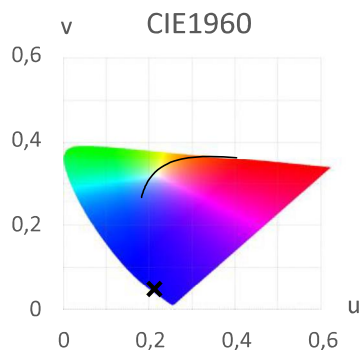
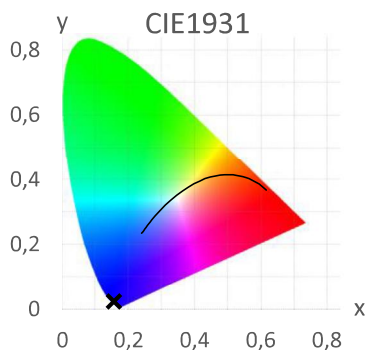
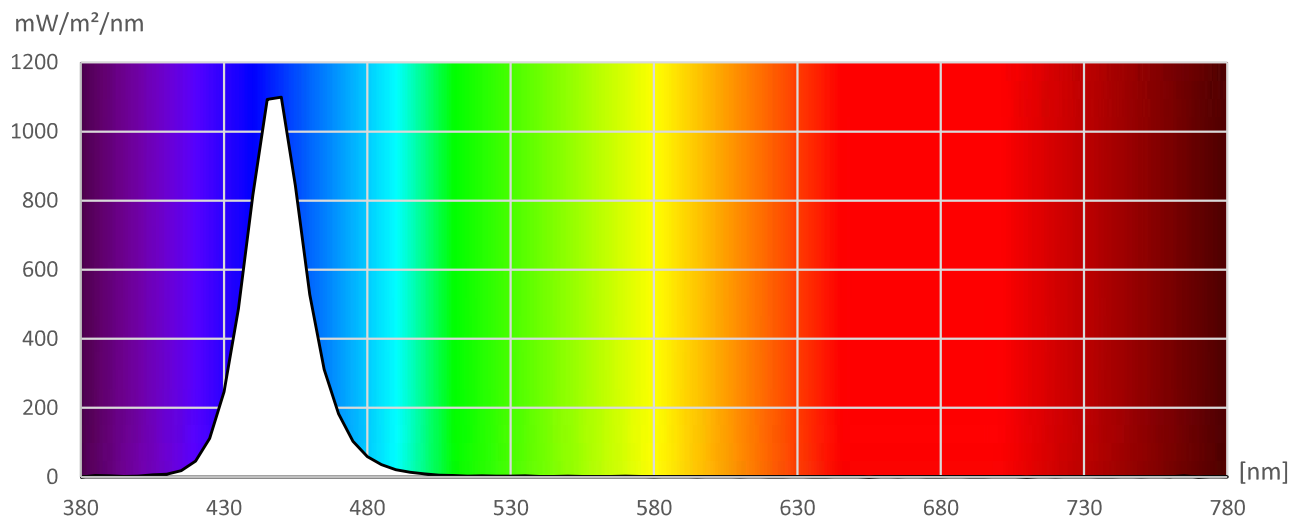
First, last name of inspector

Measurement protocol

th•mann

Test object: Fun Generation
PicoBeam 60 COB RGBW
442853 / blue / @ 3 m

Measurement file: 442853_blue_3m.c
Date of measurement: 30.09.2019
Time of measurement: 15:06:25



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Burgebrach, 30.09.2019

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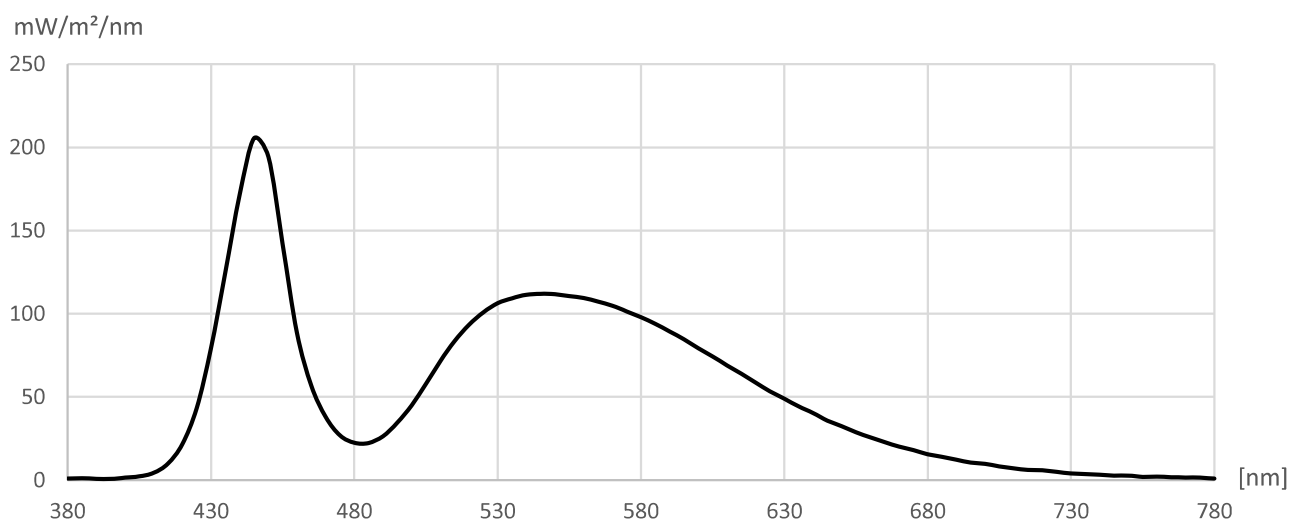
First, last name of inspector

Measurement protocol

th.mann

Test object: Fun Generation
PicoBeam 60 COB RGBW
442853 / white / @ 3 m

Measurement file: 442853_cw_3m.CSV
Date of measurement: 30.09.2019
Time of measurement: 15:06:41



R1 = 67,8	Ra = 69,8	Illuminance	6513,1 lx	CIE1931
R2 = 72,2	Re = 59,0	Ee	20,319 W/m²	x = 0,3088
R3 = 74,6	GAI = 85,3	LER	320,5 lm/W	y = 0,3303
R4 = 71,5				
R5 = 69,7		correlated color temperature (CCT)	6706 K	CIE1976
R6 = 63,8		Duv	0,0059	u' = 0,1946
R7 = 78,7				v' = 0,4684
R8 = 60,3		Saturation	8,5 %	
R9 = -33,5				CIE1960
R10 = 33,7		Dominant wavelength	487 nm	u = 0,1946
R11 = 69,7		Peak wavelength	447 nm	v = 0,3123
R12 = 41,3				
R13 = 67,5		Flicker frequency	183,1 Hz	TM30
R14 = 85,7		Percent Flicker	6,6 %	Rf = 67,7
R15 = 61,5		Flicker index	0,005	Rg = 93,7

[nm]	mW/m²/nm	[nm]	mW/m²/nm	[nm]	mW/m²/nm	[nm]	mW/m²/nm	[nm]	mW/m²/nm	[nm]	mW/m²/nm	[nm]	mW/m²/nm
380	0,99	440	171,56	500	45,05	560	109,46	620	58,54	680	15,67	740	3,38
385	1,23	445	205,44	505	58,05	565	107,35	625	53,48	685	14,07	745	2,81
390	0,87	450	194,33	510	71,59	570	104,85	630	48,96	690	12,31	750	2,85
395	0,75	455	142,40	515	83,63	575	101,51	635	44,36	695	10,65	755	1,99
400	1,53	460	88,78	520	93,36	580	97,89	640	40,45	700	9,76	760	2,24
405	2,36	465	56,98	525	100,94	585	93,99	645	35,87	705	8,37	765	1,87
410	4,40	470	38,10	530	106,33	590	89,31	650	32,52	710	7,13	770	1,67
415	10,10	475	26,93	535	109,34	595	84,74	655	28,83	715	6,26	775	1,58
420	21,77	480	22,47	540	111,42	600	79,38	660	25,79	720	5,94	780	0,93
425	43,51	485	22,41	545	112,06	605	74,44	665	22,97	725	4,99		
430	78,89	490	26,41	550	111,74	610	69,08	670	20,16	730	4,09		
435	124,60	495	34,53	555	110,70	615	63,93	675	18,11	735	3,73		

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Sebastian Laske

Burgebrach, 30.09.2019

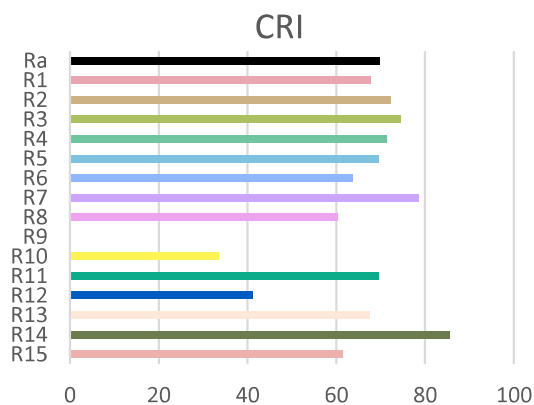
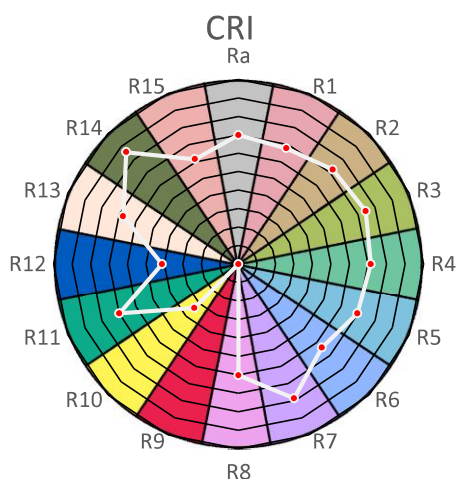
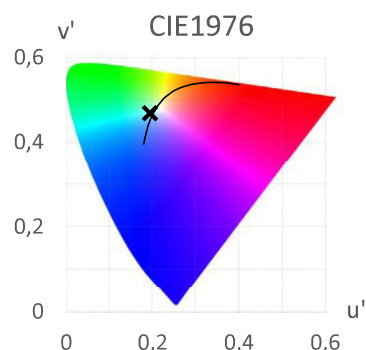
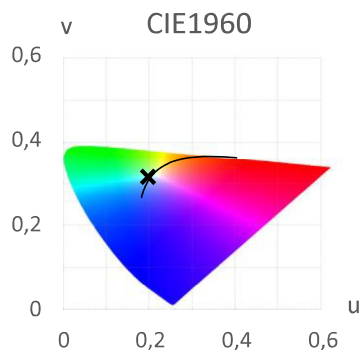
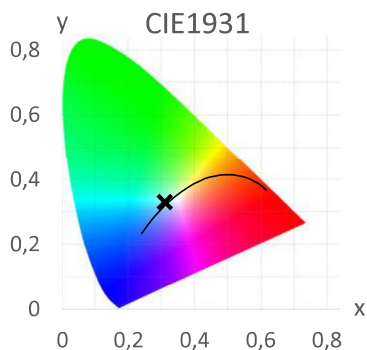
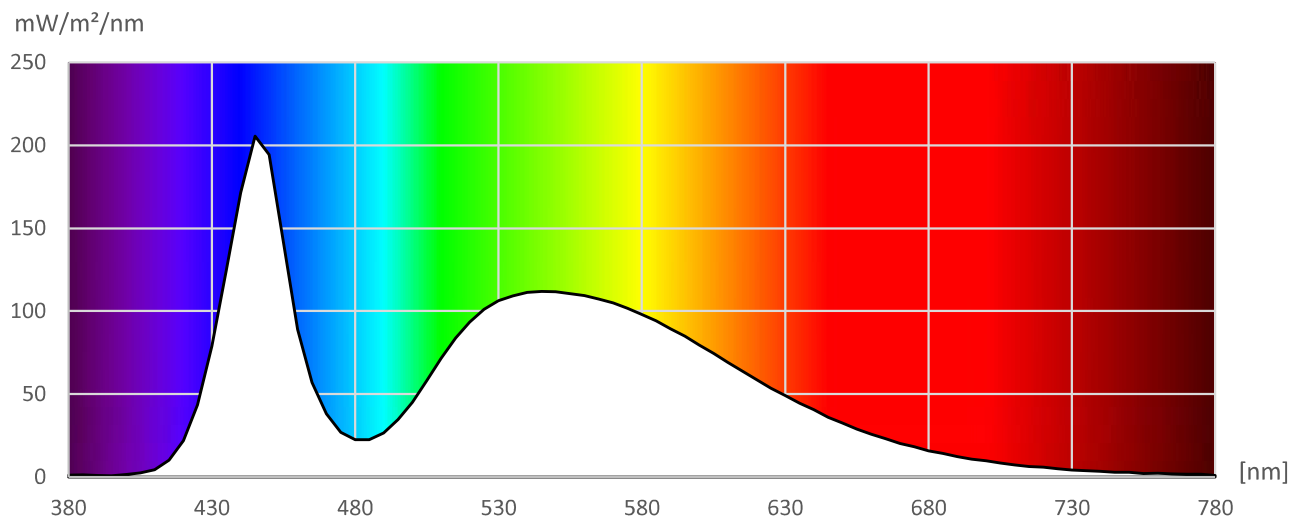
First, last name of inspector

Measurement protocol

th•mann

Test object: Fun Generation
PicoBeam 60 COB RGBW
442853 / white / @ 3 m

Measurement file: 442853_cw_3m.CS
Date of measurement: 30.09.2019
Time of measurement: 15:06:41



Thomann GmbH
Hans-Thomann-Str. 1
D-96138 Burgebrach, Germany

Burgebrach, 30.09.2019

Sebastian Laske

First, last name of inspector